

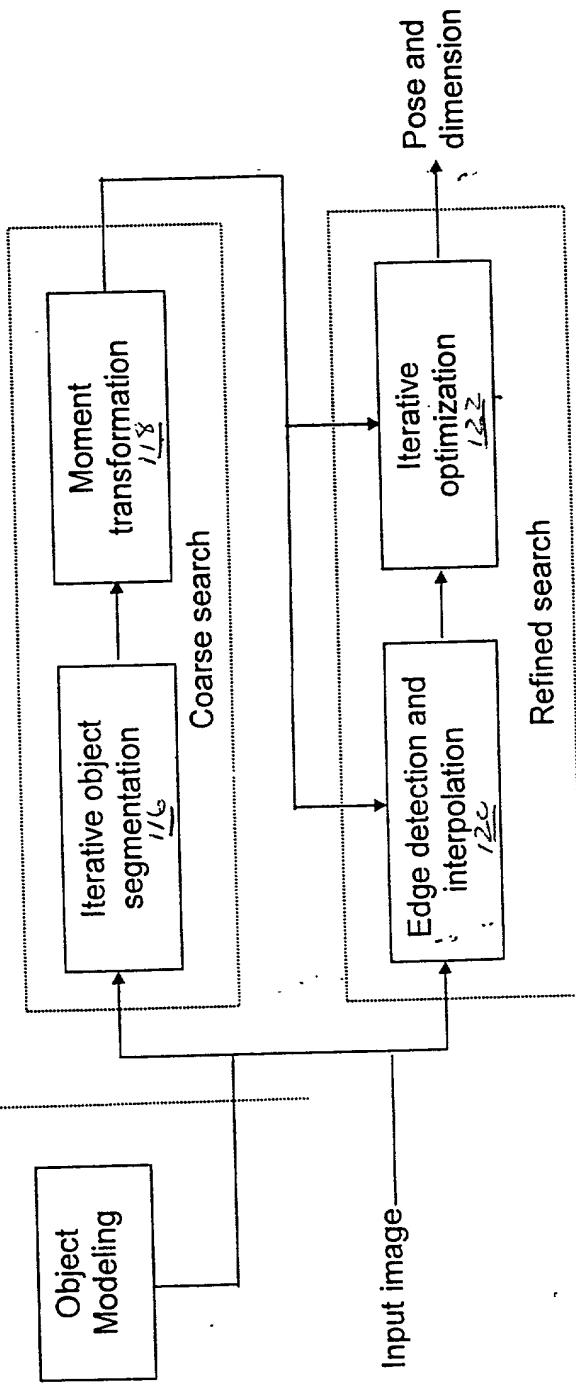
110

112

Offline process

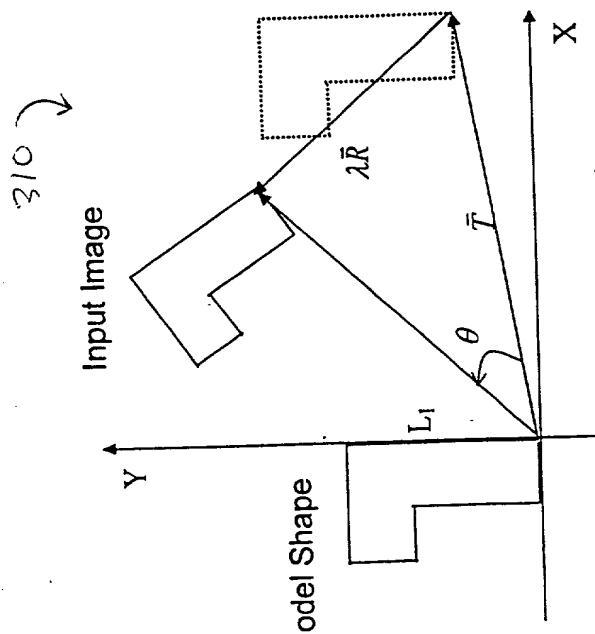
114

Runtime Process

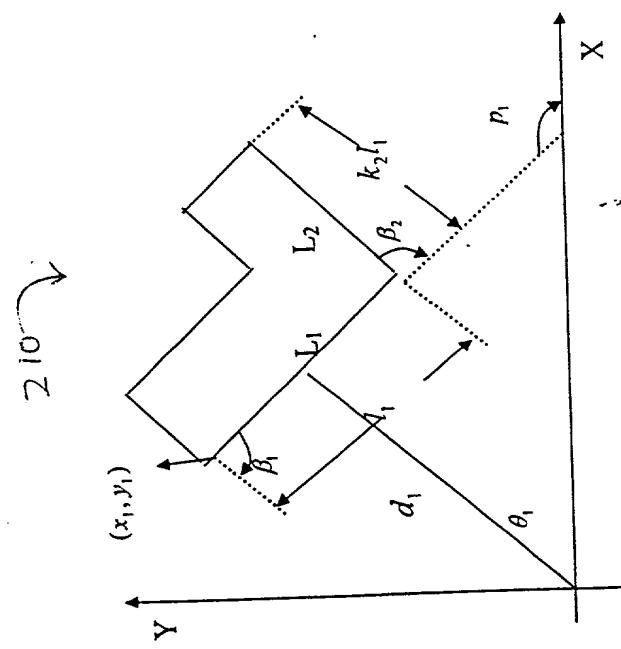


The model-based algorithm for localization and measurement of miniature SMC objects.

Fig. 1



A linear transformation between the model shape and the input image can be parameterized by translation, rotation, and scaling.



A polygon defined by the variables  $(l_1, x_1, y_1, k_1, \beta_1)$

Fig. 2  
Fig. 3

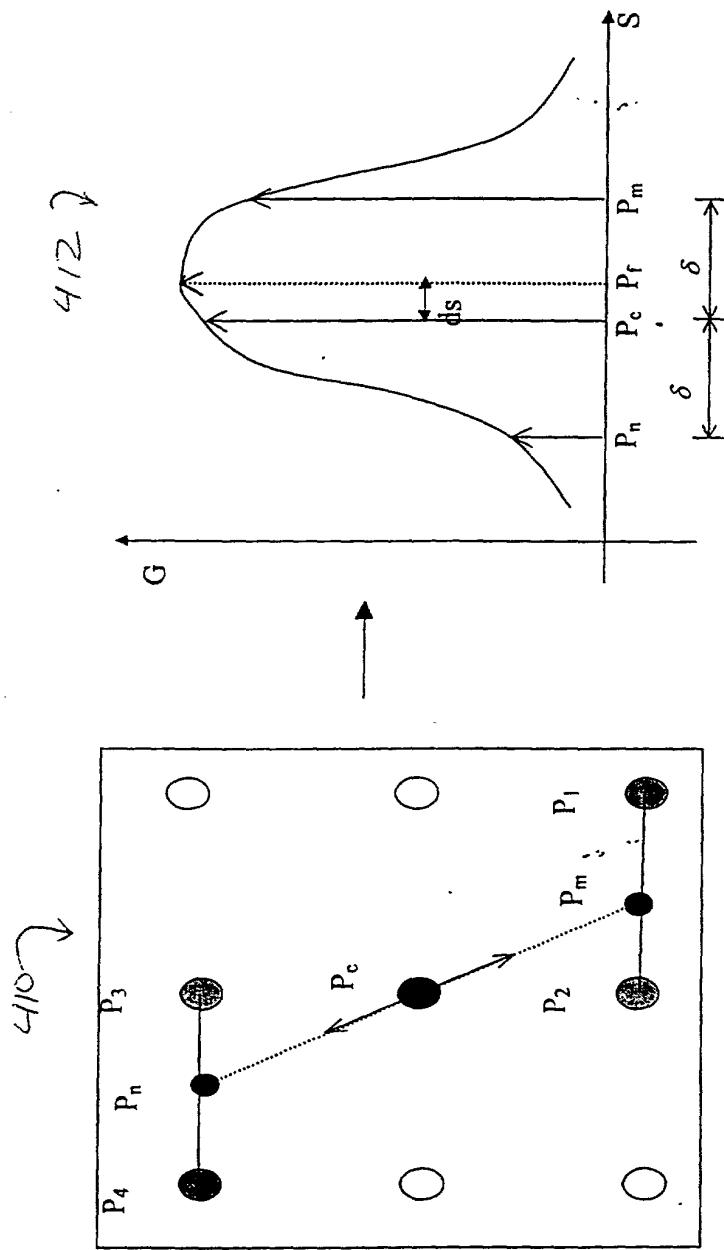
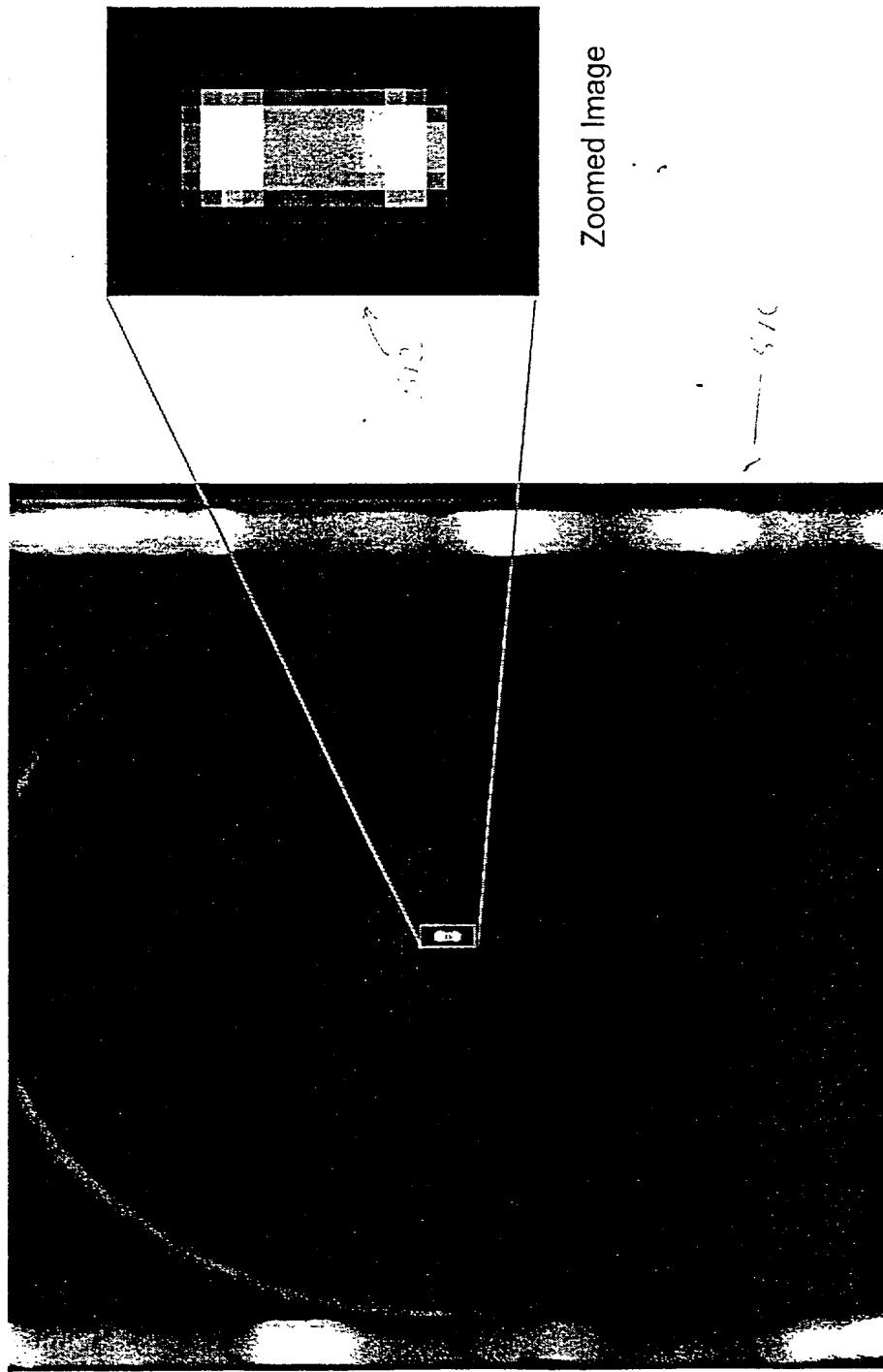


Fig. 4A

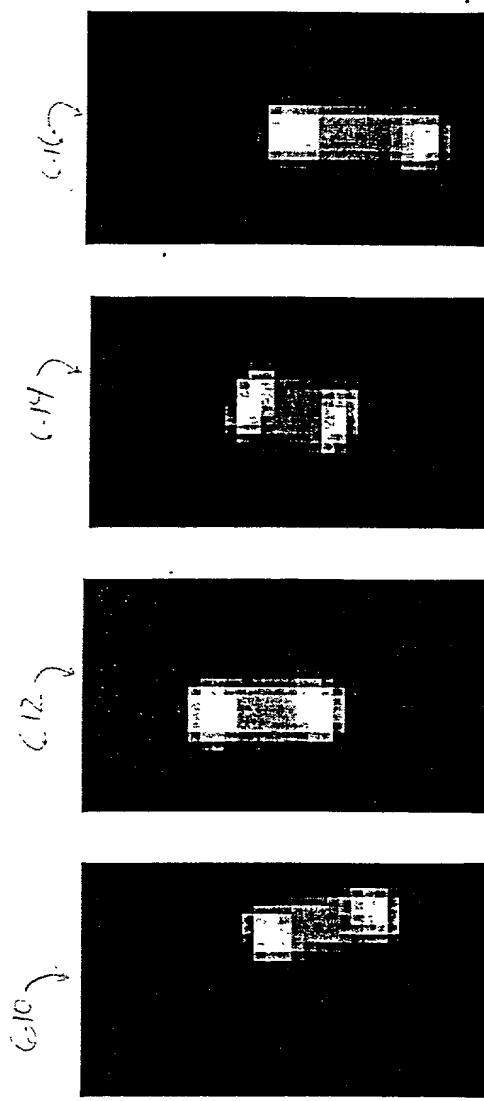
Fig. 4B

## Bi- Linear Interpolation



A typical image of the miniature SMC object acquired from a pick-and-place system

Fig. 5

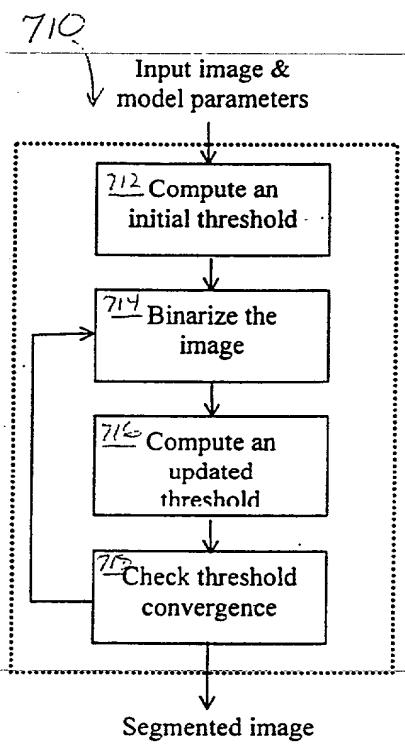


Images synthesized from our simulation process

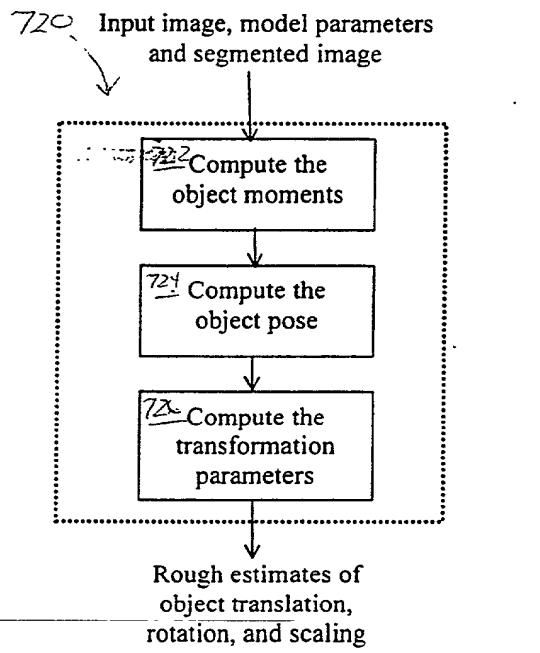
Fig. 6

## Flow Charts of Coarse Search

2007-2008-2009



Object segmentation flow chart

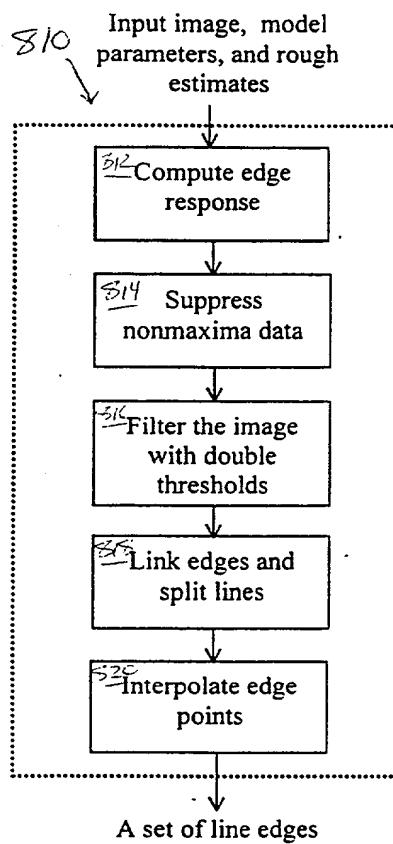


Moment transformation flow chart

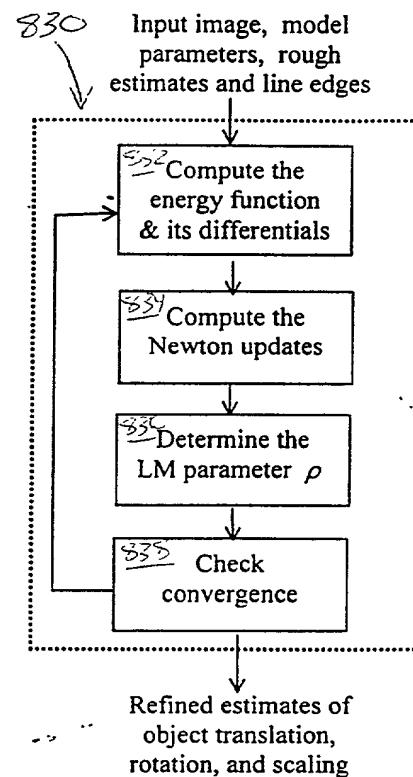
Fig. 7A

Fig. 7B

## Flow Charts of Refined Search



Edge pixel detection flow chart



Pose optimization flow chart

**Fig. 8A**

**Fig. 8B**